KAH Sep 23/1999

L1 2457 ORNITHINE TRANSCARBAMYLASE

=> s l1 and py<1995

<------User Break------>
u
SEARCH ENDED BY USER

=> s l1 and py<1994

1 FILES SEARCHED...
L2 1823 L1 AND PY<1994

=> s l2 and signal peptide

L3 14 L2 AND SIGNAL PEPTIDE

=> d l4 ibib ti all

L4 NOT FOUND
The L-number entered has not been defined in this session, or it has been deleted. To see the L-numbers currently defined in this session, enter DISPLAY HISTORY at an arrow prompt (=>).

=> d l3 ibib ti all

L3 ANSWER 1 OF 14 BIOSIS COPYRIGHT 1999 BIOSIS
ACCESSION NUMBER: 1991:269942 BIOSIS
DOCUMENT NUMBER: BA92:2557
TITLE: EFFECTS OF PROTEIN SIZE ON THE RATE OF IMPORT OF THE PRECURSORS OF ALDEHYDE DEHYDROGENASE AND **ORNITHINE TRANSCARBAMYLASE** INTO RAT LIVER MITOCHONDRIA.
AUTHOR(S): WANG T T Y; WANG Y; WEINER H
CORPORATE SOURCE: DEP. BIOCHEM., PURDUE UNIV., WEST LAFAYETTE, INDIANA 47907.
SOURCE: ALCOHOL CLIN EXP RES, (1991) 15 (2), 286-290.
CODEN: ACRSDM. ISSN: 0145-6008.
FILE SEGMENT: BA; OLD
LANGUAGE: English
TI EFFECTS OF PROTEIN SIZE ON THE RATE OF IMPORT OF THE PRECURSORS OF ALDEHYDE DEHYDROGENASE AND **ORNITHINE TRANSCARBAMYLASE** INTO RAT LIVER MITOCHONDRIA.
AN 1991:269942 BIOSIS
DN BA92:2557
TI EFFECTS OF PROTEIN SIZE ON THE RATE OF IMPORT OF THE PRECURSORS OF ALDEHYDE DEHYDROGENASE AND **ORNITHINE TRANSCARBAMYLASE** INTO RAT LIVER MITOCHONDRIA.
AU WANG T T Y; WANG Y; WEINER H
CS DEP. BIOCHEM., PURDUE UNIV., WEST LAFAYETTE, INDIANA 47907.
SO ALCOHOL CLIN EXP RES, (1991) 15 (2), 286-290.
CODEN: ACRSDM. ISSN: 0145-6008.
FS BA; OLD
LA English
AB It is known that a **signal peptide** is required for the import of a protein into mitochondrial matrix. It is also known that a **signal peptide** can be attached to any protein and allow it to be imported. We recently reported that the rate of import of rat liver mitochondrial aldehyde dehydrogenase precursor was slower than that

of **ornithine transcarbamylase** percursor (Wang TTY, Farres J, and Weiner H. Arch Biochem Biophys 272, 440-449, 1989). It was not known if the difference in the rate of import was related to the fact that the mature portion of aldehyde dehydrogenase is larger (500 amino acids compared with 322 amino acids) or because the signal peptides were different. We further showed that treatment of the mitochondria with alcohols caused an inhibition of the import of the precusor of aldehyde dehydrogenase but not that of **ornithine transcarbamylase** . In the present study we constructed chimeric proteins that contained the **signal peptide** from one precursor protein and the mature portion from the other. We found that the rate of import was related to the overall size of the precursor protein. Consistent with this observation was finding that a truncated aldehyde dehydrogenase precursor, which contained 317 amino acids, was imported more rapidly than was the authentic precursor. Consistent with this finding was the fact that butanol caused the inhibition of only the large precursor proteins. Thus, it appears that size of the protein being imported is a major determinant of the rate at which a precursor protein is imported into mitochondria.

CC Cytology and Cytochemistry - Animal *02506
Biochemical Studies - Proteins, Peptides and Amino Acids 10064
Biophysics - Membrane Phenomena *10508
Enzymes - Physiological Studies *10808
Metabolism - Proteins, Peptides and Amino Acids *13012
Digestive System - Anatomy *14002
Digestive System - Physiology and Biochemistry *14004
BC Muridae 86375
RN 9001-69-8 (**ORNITHINE TRANSCARBAMYLASE**)
9028-86-8 (ALDEHYDE DEHYDROGENASE)

=> d l3 ibib ti 1-14

L3 ANSWER 1 OF 14 BIOSIS COPYRIGHT 1999 BIOSIS
ACCESSION NUMBER: 1991:269942 BIOSIS
DOCUMENT NUMBER: BA92:2557
TITLE: EFFECTS OF PROTEIN SIZE ON THE RATE OF IMPORT OF THE PRECURSORS OF ALDEHYDE DEHYDROGENASE AND **ORNITHINE TRANSCARBAMYLASE** INTO RAT LIVER MITOCHONDRIA.
AUTHOR(S): WANG T T Y; WANG Y; WEINER H
CORPORATE SOURCE: DEP. BIOCHEM., PURDUE UNIV., WEST LAFAYETTE, INDIANA 47907.
SOURCE: ALCOHOL CLIN EXP RES, (1991) 15 (2), 286-290.
CODEN: ACRSDM. ISSN: 0145-6008.
FILE SEGMENT: BA; OLD
LANGUAGE: English
TI EFFECTS OF PROTEIN SIZE ON THE RATE OF IMPORT OF THE PRECURSORS OF ALDEHYDE DEHYDROGENASE AND **ORNITHINE TRANSCARBAMYLASE** INTO RAT LIVER MITOCHONDRIA.

L3 ANSWER 2 OF 14 BIOSIS COPYRIGHT 1999 BIOSIS
ACCESSION NUMBER: 1990:473150 BIOSIS
DOCUMENT NUMBER: BA90:112570
TITLE: IMPORT OF CHEMICALLY SYNTHESIZED SIGNAL PEPTIDES INTO RAT LIVER MITOCHONDRIA.
AUTHOR(S): PAK Y K; WEINER H
CORPORATE SOURCE: DEP. BIOCHEM., PURDUE UNIV., WEST LAFAYETTE, INDIANA 47907.
SOURCE: J BIOL CHEM, (1990) 265 (24), 14298-14307.
CODEN: JBCHA3. ISSN: 0021-9258.
FILE SEGMENT: BA; OLD
LANGUAGE: English
TI IMPORT OF CHEMICALLY SYNTHESIZED SIGNAL PEPTIDES INTO RAT LIVER

MITOCHONDRIA.

L3 ANSWER 3 OF 14 BIOSIS COPYRIGHT 1999 BIOSIS
ACCESSION NUMBER: 1[redacted]:402602 BIOSIS
DOCUMENT NUMBER: BA88:72027
TITLE: LIVER MITOCHONDRIAL ALDEHYDE DEHYDROGENASE IN-VITRO EXPRESSION IN-VITRO IMPORT AND EFFECT OF ALCOHOLS ON IMPORT.
AUTHOR(S): WANG T T Y; FARRES J; WEINER H
CORPORATE SOURCE: DEP. BIOCHEM., PURDUE UNIV., WEST LAFAYETTE, INDIANA 47907.
SOURCE: ARCH BIOCHEM BIOPHYS, (1989) 272 (2), 440-449.
CODEN: ABBIA4. ISSN: 0003-9861.
FILE SEGMENT: BA; OLD
LANGUAGE: English
TI LIVER MITOCHONDRIAL ALDEHYDE DEHYDROGENASE IN-VITRO EXPRESSION IN-VITRO IMPORT AND EFFECT OF ALCOHOLS ON IMPORT.

L3 ANSWER 4 OF 14 MEDLINE
ACCESSION NUMBER: 91282058 MEDLINE
DOCUMENT NUMBER: 91282058
TITLE: Effects of protein size on the rate of import of the precursors of aldehyde dehydrogenase and **ornithine transcarbamylase** into rat liver mitochondria.
AUTHOR: Wang T T; Wang Y; Weiner H
CORPORATE SOURCE: Department of Biochemistry, Purdue University, W. Lafayette, Indiana 47907..
CONTRACT NUMBER: AA08512 (NIAAA)
P50-07611 (NIAAA)
AA05276
+
SOURCE: ALCOHOLISM, CLINICAL AND EXPERIMENTAL RESEARCH, **(1991 Mar)** 15 (2) 286-90.
Journal code: 35X. ISSN: 0145-6008.
PUB. COUNTRY: United States
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199110
TI Effects of protein size on the rate of import of the precursors of aldehyde dehydrogenase and **ornithine transcarbamylase** into rat liver mitochondria.

L3 ANSWER 5 OF 14 MEDLINE
ACCESSION NUMBER: 90354413 MEDLINE
DOCUMENT NUMBER: 90354413
TITLE: Import of chemically synthesized signal peptides into rat liver mitochondria.
AUTHOR: Pak Y K; Weiner H
CORPORATE SOURCE: Department of Biochemistry, Purdue University, West Lafayette, Indiana 47907.
CONTRACT NUMBER: AA05812 (NIAAA)
AA00028 (NIAAA)
SOURCE: JOURNAL OF BIOLOGICAL CHEMISTRY, **(1990 Aug 25)** 265 (24) 14298-307.
Journal code: HIV. ISSN: 0021-9258.
PUB. COUNTRY: United States
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals; Cancer Journals
ENTRY MONTH: 199011
TI Import of chemically synthesized signal peptides into rat liver mitochondria.

L3 ANSWER 6 OF 14 MEDLINE
ACCESSION NUMBER: 89321555 MEDLINE

DOCUMENT NUMBER: 89321555
TITLE: Liver mitochondrial aldehyde dehydrogenase: in vitro expression, in vitro import, and effect of alcohols on import.
AUTHOR: Wang T T; Farres J; Weiner H
CORPORATE SOURCE: Department of Biochemistry, Purdue University, West Lafayette, Indiana 47907.
CONTRACT NUMBER: AA08512 (NIAAA)
AA05276 (NIAAA)
AA00028 (NIAAA)
SOURCE: ARCHIVES OF BIOCHEMISTRY AND BIOPHYSICS, **(1989 Aug 1)** 272 (2) 440-9.
Journal code: 6SK. ISSN: 0003-9861.
PUB. COUNTRY: United States
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals; Cancer Journals
ENTRY MONTH: 198910
TI Liver mitochondrial aldehyde dehydrogenase: in vitro expression, in vitro import, and effect of alcohols on import.

L3 ANSWER 7 OF 14 CAPLUS COPYRIGHT 1999 ACS
ACCESSION NUMBER: 1991:242966 CAPLUS
DOCUMENT NUMBER: 114:242966
TITLE: Effects of protein size on the rate of import of the precursors of aldehyde dehydrogenase and **ornithine transcarbamylase** into rat liver mitochondria
AUTHOR(S): Wang, Thomas T. Y.; wang, Yi; Weiner, Henry
CORPORATE SOURCE: Dep. Biochem., Purdue Univ., West Lafayette, IN, 47907, USA
SOURCE: Alcohol.: Clin. Exp. Res. (**1991**), 15(2), 286-90
CODEN: ACRSDM; ISSN: 0145-6008
DOCUMENT TYPE: Journal
LANGUAGE: English
TI Effects of protein size on the rate of import of the precursors of aldehyde dehydrogenase and **ornithine transcarbamylase** into rat liver mitochondria

L3 ANSWER 8 OF 14 CAPLUS COPYRIGHT 1999 ACS
ACCESSION NUMBER: 1990:586691 CAPLUS
DOCUMENT NUMBER: 113:186691
TITLE: Import of chemically synthesized signal peptides into rat liver mitochondria
AUTHOR(S): Pak, Youngmi Kim; Weiner, Henry
CORPORATE SOURCE: Dep. Biochem., Purdue Univ., West Lafayette, IN, 47907, USA
SOURCE: J. Biol. Chem. (**1990**), 265(24), 14298-307
CODEN: JBCHA3; ISSN: 0021-9258
DOCUMENT TYPE: Journal
LANGUAGE: English
TI Import of chemically synthesized signal peptides into rat liver mitochondria

L3 ANSWER 9 OF 14 CAPLUS COPYRIGHT 1999 ACS
ACCESSION NUMBER: 1989:611028 CAPLUS
Correction of: 1988:488765
DOCUMENT NUMBER: 111:211028
Correction of: 109:88765
TITLE: The **ornithine transcarbamylase** leader peptide directs mitochondrial import through both its midportion structure and net positive charge
AUTHOR(S): Horwich, A. L.; Kalousek, F.; Fenton, W. A.; Furtak, K.; Pollock, R. A.; Rosenberg, L. E.
CORPORATE SOURCE: Sch. Med., Yale Univ., New Haven, CT, 06510, USA

SOURCE: J. Cell Biol. (**1987**), 105(2), 669-77
CODEN: JCLBA3; ISSN: 0021-9525
DOCUMENT TYPE: Journal
LANGUAGE: English
TI The **ornithine transcarbamylase** leader peptide directs mitochondrial import through both its midportion structure and net positive charge

L3 ANSWER 10 OF 14 CAPLUS COPYRIGHT 1999 ACS
ACCESSION NUMBER: 1989:529784 CAPLUS
DOCUMENT NUMBER: 111:129784
TITLE: Liver mitochondrial aldehyde dehydrogenase: in vitro expression, in vitro import, and effect of alcohols on import
AUTHOR(S): Wang, Thomas T. Y.; Farres, Jaume; Weiner, Henry
CORPORATE SOURCE: Dep. Biochem., Purdue Univ., West Lafayette, IN, 47907, USA
SOURCE: Arch. Biochem. Biophys. (**1989**), 272(2), 440-9
CODEN: ABBIA4; ISSN: 0003-9861
DOCUMENT TYPE: Journal
LANGUAGE: English
TI Liver mitochondrial aldehyde dehydrogenase: in vitro expression, in vitro import, and effect of alcohols on import

L3 ANSWER 11 OF 14 CAPLUS COPYRIGHT 1999 ACS
ACCESSION NUMBER: 1989:473158 CAPLUS
DOCUMENT NUMBER: 111:73158
TITLE: Synthetic transit peptides inhibit import and processing of mitochondrial precursor proteins
AUTHOR(S): Chu, Thomas W.; Eftime, Raluca; Sztul, Elizabeth; Strauss, Arnold W.
CORPORATE SOURCE: Sch. Med., Washington Univ., St. Louis, MO, 63110, USA
SOURCE: J. Biol. Chem. (**1989**), 264(16), 9552-8
CODEN: JBCHA3; ISSN: 0021-9258
DOCUMENT TYPE: Journal
LANGUAGE: English
TI Synthetic transit peptides inhibit import and processing of mitochondrial precursor proteins

L3 ANSWER 12 OF 14 CAPLUS COPYRIGHT 1999 ACS
ACCESSION NUMBER: 1988:488765 CAPLUS
DOCUMENT NUMBER: 109:88765
TITLE: The **ornithine transcarbamylase** leader peptide directs mitochondrial import through both its midportion structure and net positive charge
AUTHOR(S): Horwich, A. L.; Kalousek, F.; Fenton, W. A.; Furtak, K.; Pollock, R. A.; Rosenberg, L. E.
CORPORATE SOURCE: Sch. Med., Yale Univ., New Haven, CT, 06510, USA
SOURCE: J. Cell Biol. (**1987**), 105(2), 669-77
CODEN: JCLBA3; ISSN: 0021-9525
DOCUMENT TYPE: Journal
LANGUAGE: English
TI The **ornithine transcarbamylase** leader peptide directs mitochondrial import through both its midportion structure and net positive charge

L3 ANSWER 13 OF 14 CAPLUS COPYRIGHT 1999 ACS
ACCESSION NUMBER: 1986:201285 CAPLUS
DOCUMENT NUMBER: 104:201285
TITLE: Targeting of pre-**ornithine transcarbamylase** to mitochondria: definition of critical regions and residues in the leader peptide

AUTHOR(S): Horwich, Arthur L.; Kalousek, Frantisek; Fenton, Wayne
A.; Pollock, Robert A.; Rosenberg, Leon E.
CORPORATE SOURCE: Sch. Med., Yale Univ., New Haven, CT, 06510, USA
SOURCE: Cell (Cambridge, Mass.) (**1986**), 44(3), 451-9
CODEN: CELLB5; ISSN: 0092-8674
DOCUMENT TYPE: Journal
LANGUAGE: English
TI Targeting of pre-**ornithine transcarbamylase** to mitochondria: definition of critical regions and residues in the leader peptide

L3 ANSWER 14 OF 14 CAPLUS COPYRIGHT 1999 ACS
ACCESSION NUMBER: 1985:90714 CAPLUS
DOCUMENT NUMBER: 102:90714
TITLE: A highly basic N-terminal extension of the mitochondrial matrix enzyme **ornithine transcarbamylase** from rat liver
AUTHOR(S): McIntyre, Peter; Graf, Lynda; Mercer, Julian; Peterson, Gregory; Hudson, Peter; Hoogenraad, Nicholas
CORPORATE SOURCE: Dep. Biochem., La Trobe Univ., Bundoora, 3083, Australia
SOURCE: FEBS Lett. (**1984**), 177(1), 41-6
CODEN: FEBLAL; ISSN: 0014-5793
DOCUMENT TYPE: Journal
LANGUAGE: English
TI A highly basic N-terminal extension of the mitochondrial matrix enzyme **ornithine transcarbamylase** from rat liver

=> d 13 14 all

L3 ANSWER 14 OF 14 CAPLUS COPYRIGHT 1999 ACS
AN 1985:90714 CAPLUS
DN 102:90714
TI A highly basic N-terminal extension of the mitochondrial matrix enzyme **ornithine transcarbamylase** from rat liver
AU McIntyre, Peter; Graf, Lynda; Mercer, Julian; Peterson, Gregory; Hudson, Peter; Hoogenraad, Nicholas
CS Dep. Biochem., La Trobe Univ., Bundoora, 3083, Australia
SO FEBS Lett. (**1984**), 177(1), 41-6
CODEN: FEBLAL; ISSN: 0014-5793
DT Journal
LA English
CC 3-3 (Biochemical Genetics)
Section cross-reference(s): 7
AB The amino acid sequence of the N-terminal leader peptide of the mitochondrial enzyme **ornithine transcarbamylase** was deduced from a cDNA clone obtained from a rat liver cDNA library. The sequence is remarkable in being highly basic, having 4 arginine, 3 lysine, 1 histidine, and no acidic residues in a total of 32 residues. The leader sequence has no extensive hydrophobic stretches, has 72% homol. with the leader peptide of human **ornithine transcarbamylase**, and in terms of its basic character, resembles the N-terminal extensions on a no. of fungal mitochondrial and pea chloroplast proteins. Thus, the basic nature of these leader peptides may constitute the signal for mitochondrial import.
ST **ornithine transcarbamylase** leader peptide sequence; liver **ornithine transcarbamylase** precursor sequence; **signal peptide ornithine transcarbamylase** precursor
IT Protein sequences

(of preornithine transcarbamylase **signal peptide**, of liver mitochondria, complete)

IT Liver, composition
(preornithine transcarbamylase **signal peptide** mitochondria of, amino acid sequence of)

IT Mitochondria
(preornithine transcarbamylase **signal peptide** of, of liver, amino acid sequence of)

IT Deoxyribonucleic acid sequences
(ornithine carbamoyltransferase-specifying, **signal peptide** region of, of liver mitochondria)

IT Peptides, properties
RL: PRP (Properties)
(signal, of preornithine transcarbamylase of liver mitochondria, amino acid sequence of)

IT 94949-10-7
RL: PRP (Properties)
(amino acid sequence of)

IT 80146-82-3
RL: PRP (Properties)
(amino acid sequence of leader peptide of, of liver mitochondria)

=> d l3 6,9 all

L3 ANSWER 6 OF 14 MEDLINE
AN 89321555 MEDLINE
DN 89321555
TI Liver mitochondrial aldehyde dehydrogenase: in vitro expression, in vitro import, and effect of alcohols on import.
AU Wang T T; Farres J; Weiner H
CS Department of Biochemistry, Purdue University, West Lafayette, Indiana 47907.
NC AA08512 (NIAAA)
AA05276 (NIAAA)
AA00028 (NIAAA)
SO ARCHIVES OF BIOCHEMISTRY AND BIOPHYSICS, **(1989 Aug 1)** 272 (2) 440-9.
Journal code: 6SK. ISSN: 0003-9861.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals; Cancer Journals
EM 198910
AB An in vitro expression plasmid (pGRAP) that contained the cDNA coding for the rat mitochondrial aldehyde dehydrogenase precursor was constructed, mRNA was synthesized then translated, and the in vitro synthesized precursor of aldehyde dehydrogenase was used in an in vitro import assay. As expected the 19 amino acid **signal peptide** of the precursor allowed import of the precursor into rat liver mitochondria. This in vitro system was used to examine the effect of alcohols on import. It was found that the alcohols (ethyl, butyl, hexyl, and octyl) tested inhibited the import of the aldehyde dehydrogenase precursor. Pretreatment of the mitochondria with alcohol was responsible for the inhibition. The inhibition appeared to be relatively specific for pre-aldehyde dehydrogenase as the precursor of **ornithine transcarbamylase** was still imported in the presence of alcohols. Of potential physiological significance was finding that ethanol inhibited import in a dose-response fashion; 50% inhibition occurred at 75 mM, a concentration achievable during the ingestion of alcohol. In addition, the concentrations of alcohols required to produce an inhibitory effect on

import decreased as the hydrocarbon chain length of alcohols increased. The inhibitory effect of alcohols appeared to be specific as other solvents examined did not inhibit import. We postulate that alcohols may perturb the mitochondrial membrane and affect the receptor-translocator necessary for the import of the aldehyde dehydrogenase precursor.

CT Check Tags: Animal; In Vitro; Support, U.S. Gov't, P.H.S.
Aldehyde Dehydrogenase: GE, genetics
*Aldehyde Dehydrogenase: ME, metabolism
Aldehydes: PD, pharmacology
Biological Transport: DE, drug effects
Butanols: PD, pharmacology
Cloning, Molecular
DNA: GE, genetics
Genetic Engineering
Mitochondria, Liver: DE, drug effects
*Mitochondria, Liver: ME, metabolism
Ornithine Carbamoyltransferase: ME, metabolism
Plasmids
Protein Conformation: DE, drug effects
Rats
Solvents
Translation, Genetic: DE, drug effects

RN 9007-49-2 (DNA)

CN EC 1.2.1.3 (Aldehyde Dehydrogenase); EC 2.1.3.3 (Ornithine Carbamoyltransferase); 0 (Aldehydes); 0 (Butanols); 0 (Plasmids); 0 (Solvents)

L3 ANSWER 9 OF 14 CAPLUS COPYRIGHT 1999 ACS

AN 1989:611028 CAPLUS
Correction of: 1988:488765

DN 111:211028
Correction of: 109:88765

TI The **ornithine transcarbamylase** leader peptide directs mitochondrial import through both its midportion structure and net positive charge

AU Horwich, A. L.; Kalousek, F.; Fenton, W. A.; Furtak, K.; Pollock, R. A.; Rosenberg, L. E.

CS Sch. Med., Yale Univ., New Haven, CT, 06510, USA

SO J. Cell Biol. (**1987**), 105(2), 669-77
CODEN: JCLBA3; ISSN: 0021-9525

DT Journal

LA English

CC 7-5 (Enzymes)

AB The cytoplasmically synthesized precursor of the mitochondrial matrix enzyme, **ornithine transcarbamylase** (OTC), is targeted to mitochondria by its NH2-terminal leader peptide. Study of addnl. OTC precursors, altered in either a site-directed or random manner, reveals that (a) the midportion, but not the NH2-terminal half, is sufficient by itself to direct import, (b) the functional structure in the midportion is unlikely to be an amphiphilic .alpha.-helix, (c) the four arginines in the leader peptide contribute collectively to import function b conferring net pos. charge, and (d) surprisingly, proteolytic processing of the leader peptide does not require the presence of a specific primary structure at the site of cleavage in order to produce the mature OTC subunit.

ST leader peptide midportion mitochondria **ornithine transcarbamylase**

IT Mitochondria
(**ornithine transcarbamylase** of, leader peptide of, structure of midportion of)

IT Biological transport
(import, of **ornithine transcarbamylase**, to mitochondria, midportion of **signal peptide** in)

IT Peptides, biological studies

RL: BIOL (Biological study)
(signal, of **ornithine transcarbamylase**, of mitochondria, structure of midportion of)

IT 9001-69-8
RL: BIOL (Biological study)
(**signal peptide** of, of mitochondria, structure of midportion of)